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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,830	12/22/2005	Ryotaro Hayashi	SHIGA7,040APC	5909
20995 7590 02/02/2010 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614				
EXAMINER				
EOFF, ANCA				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
02/02/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
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Office Action Summary

Application No.

10/561,830

Applicant(s)

HAYASHI ET AL.

Examiner

ANCA EOFF

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17.22 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17.22 and 24-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 17, 22 and 24-28 are pending. Claims 1-16, 18-21 and 23 have been cancelled.
2. The foreign priority documents JP 2003-189707 filed on July 01, 2003 and JP 2004-119498 filed on April 14, 2004 were received and acknowledged. However, in order to benefit of the earlier filing dates, certified English translations are required.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 02, 2009 has been entered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

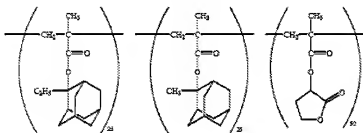
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 17, 22 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al. (US Patent 6,239,231) in view of Hada et al. (WO

03/048863, wherein the citations are from the English equivalent US Pg-Pub 2004/0058269) and in further view of Nishimura et al. (US Pg-Pub 2002/0009667).

With regard to claim 17, Fujishima et al. disclose a chemical amplifying positive resist composition comprising a resin, an acid generator (abstract) and a solvent (column 9, lines 1-15).

Fujishima et al. disclose the resin of formula (I) :



(I) (Resin I in columns 15-16).

The resin (I) comprises:

- a first unit of 2-ethyl-2-adamantyl methacrylate which is equivalent to the unit (a1) of the instant application;
- a second unit of 2-methyl-2-adamantyl methacrylate which is equivalent to the unit (a2) of the instant application, as shown in the copolymer (A) on page 29 of the specification, and
- a third unit equivalent to the unit (a3) containing a lactone group of the instant application.

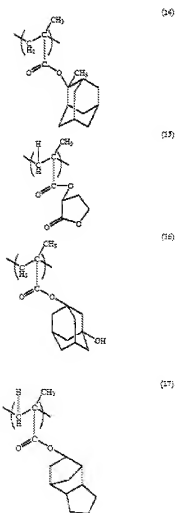
Fujishima et al. further teach that the resins used for the positive resist composition may also comprise units of 3-hydroxy-1-adamantyl (meth)acrylate (see

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column 2, lines 13-18, column 3, lines 11-13), which are equivalent to the unit (a4) of the instant application.

However, Fujishima et al. do not specifically disclose a resin component comprising the units (a5) of the instant application.

Hada et al. disclose a chemically amplified positive type resist composition comprising a resin (A) (par.0012), which may be the copolymer of formula (II):



(II) (resin (A) in par.0057).

Also, it is known in the art that a mixture of resins may be used in a chemically amplified positive tone resist, as shown by Nishimura et al. in par.0266.

As Nishimura et al. teach that mixture of resins may be used in a chemically amplified positive tone resist, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the resin (I) of Fujishima et al. in a mixture with the resin (II) of Hada in a chemically amplified resist.

The examiner would like to note that the specification of the instant application clearly shows that the component (A) may be a mixture of resins (see page 18). A copolymer (A1) may comprise the units (a1), (a2) and (a3). A copolymer comprising units (a4) and (a5) may be separately prepared and the two copolymers may be mixed together (see page 17).

Therefore, the mixture of the resins (I) and (II) of Fujishima modified by Hada meets the limitations for the component (A) of the instant application.

The resin (I) of Fujishima et al. is equivalent to the copolymer (A1) comprising the units (a1), (a2) and (a3) of the instant application. The units (a1) and (a2) account for 50 mol% of the units constituting the copolymer (A1), which is within the range of the instant application.

In the resin (II) of Hada et al., the unit (14) is equivalent to the unit (a2) of the instant application.

The unit (15) is equivalent to the unit (a3) of the instant application.

The unit (16) is equivalent to the unit (a4) of the instant application.

The unit (17) is equivalent to the unit (a5) of the instant application.

Therefore, the mixture of resins (I) and (II) comprise all the required units (a1)-(a5).

The resins (I) and (II) of Fujishima modified by Hada comprise the a (meth)acrylate ester with a lactone group (unit (a3)) in an amount of 42.5 mol% of the combined total of all units, which is within the range of the instant application.

The unit (16) (unit (a4)) and the unit (17) (unit (a5)) are comprised in an amount of 7.5 mol% of the combined total of all units, which is within the range of the instant application.

With regard to claim 22, Fujishima et al. disclose that the solvent used for the resist composition may be propylene glycol monomethyl ether acetate (PGMEA), ethyl lactate, γ -butyrolactone or a combination thereof (column 9, lines 1-15). Fujishima et al. specifically disclose a mixture of PGMEA and γ -butyrolactone (column 18, line 67 - column 19, line 1).

With regard to claim 24, Fujishima et al. disclose that the acid generator may be diphenyliodonium trifluoromethanesulfonate (column 6, line 66), which is equivalent to the onium salt with a fluorinated alkylsulfonate anion used as acid generator (B) of the instant application.

With regard to claim 25, Fujishima et al. disclose that the chemical amplifying positive resist composition comprises nitrogen-containing organic compounds, such as amines (column 8, lines 9-56).

With regard to claim 26, Fujishima et al. disclose a process comprising the steps of:

- applying the resist composition to a substrate to form a resist film;
- drying the resist film,
- exposing for patterning;
- performing a heat-treatment, wherein the heat-treatment is equivalent to the post-exposure bake of the instant application, and
- developing with an alkali developer (column 9, lines 16-19).

With regard to claims 27-28, Fujishima et al. disclose that the heat-treatment (post-exposure bake) of the resist composition takes place at temperatures between 80°C and 120°C (see Table 1 in column 18 and Table 2 in column 19). This range overlaps the preferred range of 90-120°C of the instant application, as taught on page 26 of the specification.

The first and the second repeating units of the polymer (I) are equivalent to the units (a1) and (a2) of the copolymer of the instant application (see component (A) on page 29 of the specification).

Therefore, absent a record to the contrary, it is the examiner's position that the heating temperature during the post-exposure bake meets the limitation of claim 27.

Response to Arguments

6. Applicant's arguments with respect to the amended claims 17 and 22 and the new claims 24-28 have been considered but are moot in view of the new grounds of rejection.

The applicant shows in the Remarks that the Declaration under 37 CFR 1.132 of Mr. Hada, filed on December 02, 2009 shows unexpected advantages when the structural units (a4) and (a5) are included in the positive resist composition.

The applicant concludes that a resist composition comprising a polymer with all the units (a1), (a2), (a3), (a4) and (a5) exhibit unexpected, advantageous lithography properties over resist compositions containing a polymer which lacks the units (a4) and (a5).

However, the examiner would like to show that the results presented in the Declaration under 37 CFR 1.132 is not commensurate with the scope of claim 17.

The Declaration shows that a composition comprising a polymer with units (a1), (a2), (a3), (a4) and (a5) leads to excellent results (Test Examples 1-4).

However, Claim 17 is not claiming a *copolymer* comprising the units (a1), (a2), (a3), (a4) and (a5).

Claim 17 is claiming a *resin component (A)* comprising the units (a1), (a2), (a3), (a4) and (a5).

The specification of the instant application clearly shows that the resin component (A) may include a copolymer (A1) containing at least the units (a1) and (a2) (see page 16). It is preferred to have a copolymer wherein the units (a1), (a2) and (a3) are copolymerized (see page 17).

The specification clearly teaches that :

In those cases where a structural unit (a4) and/or a structural unit (a5) is incorporated within the component (A), the structural units (a4) and/or (a5) may be copolymerized with the other structural units, or a polymer or copolymer that contains the structural units (a4) and/or (a5) may be prepared separately from the polymer or copolymer containing the other structural units, and the two polymers or copolymers then mixed together.

In those cases where the component (A) contains all five units, namely (a1), (a2), (a3), (a4), and (a5), a pentapolymer may be used, although obtaining a copolymer with stable proportions of each of the units is difficult, and consequently a mixed resin is preferred. In such cases, configurations such as a mixture of a tetrapolymer containing (a1), (a2), (a3) and (a4), and a tetrapolymer containing (a1), (a2), (a3) and (a5), or a mixture of a tetrapolymer containing (a1), (a3), (a4) and (a5), and a tetrapolymer containing (a2), (a3), (a4) and (a5) can be used.

(see pages 17- 18).

The limitations of claim 17 are met not only by a *copolymer comprising all the units (a1)-(a5)* but also by *mixture of copolymers*, as shown in the specification.

However, the examples presented in the Declaration do not show any mixtures of copolymers constituting the resin component (A).

Therefore, the Declaration is not commensurate with the scope of claim 17.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./
Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795